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Himanshu S. Amin
AMIN & TUROCY, LLP
24th Floor, National City Center
1900 East 9th Street
Cleveland, OH 44114

EXAMINER	
ROBINSON BOYCE, AKIBA K	
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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/681,050
Filing Date: December 08, 2000
Appellant(s): CHICKERING ET AL.

Himanshu S. Amin
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 9/28/07 appealing from the Office action mailed 7/11/07.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

2003/0208402	BIBELNIEKS et al	3-2003
6,182,058	KOHAVI	2-1997

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 1, 8-10, 28 are rejected under 35 U.S.C. 102(e) as being anticipated by Bibelnieks et al (US 2003/0208402).

As per claim 1, Bibelnieks et al discloses:

Employing a component to identify the sub-population to solicit and a non-solicited sub-population by using a computer-implemented decision theoretic model constructed to maximize an expected increase in profits, ([0064, asset class/micro class, w/ [0065], shows that once the asset class/micro classes have been determined, the optimization process is performed, thereby mapping out an optimal promotion for each customer class, w/ [0067], shows an optimization process using a programming model with decision variables for mail or no mail decision of a promotional stream is determined, and also where the objective is to maximize total promotion revenue, where the mail decision represents the class to solicit, and the no mail decision represents the non-solicited class);

Setting a solicitation variable to a first value for each of a plurality of members of the solicitation sub-population and to a second value for each of a plurality of members of the non-solicitation sub-population, ([0067, decision variables represent the mail/no mail decision of a promotion stream).

Soliciting the sub-population identified to solicit, ([0062], promotion p+1 was mailed);

Setting a purchase variable to a first value for each of the plurality of members of the solicitation and the non-solicitation sub-population that made a purchase and to a second value for each of the plurality of members of the solicitation and the non-solicitation sub-population that did not make the purchase, ([0062], each p0 and p+1 entry of the observed cannibalization matrix represent the purchase variables since it represents the observed maximum possible fraction of sales based upon the customers who received both promotions and purchased product).

As per claims 8, 9, 10, Bibelnieks et al discloses:

Wherein soliciting the sub-population identified comprises mailing a solicitation to each of a plurality of members of the sub-population/wherein soliciting the sub-population identified comprises e-mailing a solicitation to each of a plurality of members of the sub-population/ Wherein soliciting the sub-population identified comprises calling each of a plurality of members of the sub-population, ([0003], first-class mail, e-mail, telemarketing).

As per claim 28, Grosser et al discloses:

A module that receives input regarding a population, ([0040], user interface that comprises keyboard and mouse for inputting information, in this case, the module is inherent since keyboards/mice require modules to function properly on a user interface);

A decision theoretic model that determines a subset of the population to solicit with the advertising and a non-solicited sub-population so as to maximize an expected increase in profits ([0067], shows an optimization process using a programming model with decision variables for mail or no mail decision of a promotional stream is determined, and also where the objective is to maximize total promotion revenue, where the mail decision represents the class to solicit, and the no mail decision represents the non-solicited class);

Means for setting a solicitation variable to a first value for each of a plurality of members of the solicitation sub-population and to a second value for each of a plurality of members of the non-solicitation sub-population, ([0067, using the optimization model to set decision variables, where the decision variables represent the mail/no mail decision of a promotion stream);

Means for setting a purchase variable to a first value for each of a plurality of members of the solicitation sub-population and to a second value for each of a plurality of members of the non-solicitation sub-population, ([0062], each p0 and p+1 entry of the observed cannibalization matrix represent the purchase variables since it represents the observed maximum possible fraction of sales based upon the customers who received both promotions and purchased product).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2-7, 11, 13-27, 29, 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bibelnieks et al (US 2003/0208402) as applied to claim 1 above, and further in view of Kohavi (US 6,182,058).

As per claims 2, 5-7,11, 24, 25, 29, 30, Bibelnieks et al discloses:

using a sample of the population to obtain values for the sample of the population for each of a solicitation variable and a purchase variable, the solicitation variable having a first value corresponding to solicitation and a second value corresponding to non-solicitation, and the purchased variable having a first value corresponding to purchase and a second value corresponding to non-purchase, ([0067], shows that a mail or no mail decision of a promotional stream is determined for a class of users, and also where the objective is to maximize total promotion revenue, where the mail decision represents the class to solicit, and the no mail decision represents the non-solicited class);

dividing the sample of the population into a non-solicitation group and a solicitation group and setting the solicitation variable to the first value for each of a plurality of members of the solicitation group and to the second value for each of a plurality of members of the non-solicitation group ([0067, using the optimization model

to set decision variables, where the decision variables represent the mail/no mail decision of a promotion stream).

Soliciting the sub-population identified/applying the decision tree against the population to identify the sub-population to solicit..., ([0062], promotion p+1 was mailed);

Setting a purchase variable to a first value for each of the plurality of members of the solicitation and the non-solicitation sub-population that made a purchase and to a second value for each of the plurality of members of the solicitation and the non-solicitation sub-population that did not make the purchase, ([0062], each p0 and p+1 entry of the observed cannibalization matrix represent the purchase variables since it represents the observed maximum possible fraction of sales based upon the customers who received both promotions and purchased product).

Bibelnieks et al fails to disclose constructing a decision tree/Utilizing a component to construct a decision tree as the decision theoretic model from the sample using a predetermined scoring criterion wherein using the decision theoretic model comprises using a decision tree/applying the decision tree against the population to identify the sub-population to solicit.../constructing a decision tree...applying the decision tree, the decision tree having a plurality of paths from a root node to a plurality of leaf nodes, each of the plurality of paths having a split on a solicitation variable having a first value corresponding to solicitation and a second value corresponding to non-solicitation/the decision tree having a plurality of paths from a root node to a plurality of leaf nodes, each of the plurality of paths having a last split on the solicitation

variable, and each of the plurality of leaf nodes providing a value for a probability conditional on at least the purchase variable/wherein each of the plurality of leaf nodes provides a value for a probability conditional on at least the purchase variable having a first value corresponding to purchase and a second value corresponding to non-purchase/wherein identifying the sub-population to solicit further initially comprises performing an experiment using a sample of the population to obtain values for the sample of the population for each of the solicitation variable and a purchase variable, the purchase variable having a first value corresponding to purchase and a second value corresponding to non-purchase, but does disclose a decision-making system that optimizes total promotion revenue in [0067].

However, Kohavi discloses:

constructing a decision tree/Utilizing a component to construct a decision tree as the decision theoretic model from the sample using a predetermined scoring criterion wherein using the decision theoretic model comprises using a decision tree/applying the decision tree against the population to identify the sub-population to solicit.../constructing a decision tree...applying the decision tree/the decision tree having a plurality of paths from a root node to a plurality of leaf nodes, each of the plurality of paths having a split on a solicitation variable having a first value corresponding to solicitation and a second value corresponding to non-solicitation/the decision tree having a plurality of paths from a root node to a plurality of leaf nodes, each of the plurality of paths having a last split on the solicitation variable, and each of the plurality of leaf nodes providing a value for a probability conditional on at least the

purchase variable/wherein each of the plurality of leaf nodes provides a value for a probability conditional on at least the purchase variable having a first value corresponding to purchase and a second value corresponding to non-purchase/wherein identifying the sub-population to solicit further initially comprises performing an experiment using a sample of the population to obtain values for the sample of the population for each of the solicitation variable and a purchase variable, the purchase variable having a first value corresponding to purchase and a second value corresponding to non-purchase, (Col. 3, lines 10-16, Fig. 6 [616], where the solicit value is represented by the make route node a decision node, and the non-solicit value is represented by make route node a leaf node], col. 5, lines 48-52, shows that values are assigned to the facet, w/ col. 10,lines 26-44, shows that the upper facet contains house proposals, and the 3rd pane of the facet contains rejected choices), Kohavi discloses this limitation in an analogous art for the purpose of showing that decision nodes are used to determine a solution for certain attributes.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to utilize a decision tree with the motivation of showing that solutions that come from the decision tree can go through several paths to come up with a solution.

Bibelnieks et al fails to disclose construction the decision tree comprises using a greedy approach, however does disclose a decision-making system that optimizes total promotion revenue in [0067].

However, Kohavi discloses:

wherein construction the decision tree comprises using a greedy approach in Fig.5, [500], in this figure, a plurality of interim leaf nodes shown in [516, 520,524, 528, and 532] are disclosed, which is a greedy approach. Kohavi discloses this approach in an analogous art for the purpose of showing an alternative approach for constructing a decision tree where many decision points will exist.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to use a greedy approach with the motivation of using a decision tree that will generate many decision points.

As per claim 3, Bibelnieks et al fails to disclose "wherein the decision tree is constructed such that the split on the solicitation variable of each of the plurality of paths is a last s p l it ",but does disclose a decision-making system that optimizes total promotion revenue in [0067].

However, Kohavi discloses:

wherein the decision tree is constructed such that the split on the solicitation variable of each of the plurality of paths is a last split, (Col. 4, lines 54-67, [when test result = true, classification occurs and a label is output, this represents the last split]). Kohavi discloses this limitation in an analogous art for the purpose of showing that the last split leads to the final decision.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to construct the decision tree such that the split on the solicitation variable represents the last split with the motivation on determining a final decision on the solicitation variable in order to decide who to solicit.

As per claim 4, Bibelnieks fails to disclose "wherein the decision tree is constructed such that the split on the solicitation variable of each of the plurality of paths is a first Split", but does disclose a decision-making system that optimizes total promotion revenue in [0067].However Kohavi discloses:

wherein the decision tree is constructed such that the split on the solicitation variable of each of the plurality of paths is a first Split, (Col. 4, lines 54-67, Fig. 6, [when test result = no, the path will lead back to the beginning of the process]). Kohavi discloses this feature in an analogous art for the purpose of showing that a decision can occur at the beginning of the process.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to construct a decision tree such that the split on the solicitation variable of each of the plurality of paths is a first split with the motivation of showing that a decision with respect to solicitation can occur at the beginning of a process.

As per claim 13, Bibelnieks et al fails to disclose "wherein construction the decision tree comprises using a greedy approach", but does disclose a decision-making system that optimizes total promotion revenue in [0067].

However, Kohavi discloses:

wherein construction the decision tree comprises using a greedy approach in Fig.5, [500], in this figure, a plurality of interim leaf nodes shown in [516, 520,524, 528, and 532] are disclosed, which is a greedy approach. Kohavi discloses this approach in an analogous art for the purpose of showing an alternative approach for constructing a decision tree where many decision points will exist.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to use a greedy approach with the motivation of using a decision tree that will generate many decision points.

As per claim 14, Bibelnieks et al fails to disclose "wherein the predetermined scoring criterion is a holdout criterion", but does disclose a decision-making system that optimizes total promotion revenue in [0067].

However, Kohavi discloses:

wherein the predetermined scoring criterion is a holdout criterion, (col. 8, lines 40-42, [holdout]. Kohavi discloses this limitation in an analogous art for the purpose of showing different methods of scoring in order to make a decision.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to use holdout criterion with the motivation of using holdout criterion in order to generate a score.

As per claim 15, Bibelnieks et al fails to disclose "wherein the predetermined scoring criterion is a cross-validation holdout criterion", but does disclose a decision-making system that optimizes total promotion revenue in [0067].

However, Kohavi discloses:

wherein the predetermined scoring criterion is a cross-validation holdout criterion, (Col. 8, lines 40-42, [cross-validation]). Kohavi discloses this limitation in an analogous art for the purpose of showing different methods of scoring in order to make a decision.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to use cross-validation criterion with the motivation of using cross-validation data in order to generate a score.

As per claims 16, 17, Bibelnieks et al discloses

wherein the predetermined scoring criterion is a marginal likelihood criterion/wherein the predetermined scoring criterion is an adjusted marginal likelihood criterion, ([0012], shows customers most likely to respond to a marketing event are used, also shows how customers are scored using RFM scores, in this case, it is obvious that the scoring criterion can be adjusted since customers continuously change their responses to marketing events, thereby having to adjust the likelihood of their response).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to have an adjusted marginal likelihood criterion with the motivation of adjusting criteria to reflect changes in customer habits.

As per claim 18, Bibelnieks et al fails to disclose "wherein the split on the solicitation variable of each of the plurality of paths is a last split", but does disclose a decision-making system that optimizes total promotion revenue in [0067].

However Kohavi discloses:

wherein the split on the solicitation variable of each of the plurality of paths is a last split, (Col. 4, lines 54-67, [when test result = true, classification occurs and a label is output, this represents the last split]). Kohavi discloses this limitation in an analogous art for the purpose of showing that the last split leads to the final decision.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to construct the decision tree such that the split on the solicitation variable represents the last split with the motivation on determining a final decision on the solicitation variable in order to decide who to solicit.

As per claim 19, Bibelnieks et al fails to disclose "initializing the decision tree with an initial single leaf node as the root node, using the greedy approach..., performing a split on the solicitation variable...", but does disclose a decision-making system that optimizes total promotion revenue in [0067].

However Kohavi discloses:

initializing the decision tree with an initial single leaf node as the root node, (Fig. 5 [504]) ;

using the greedy approach to construct the decision tree with no splits on the solicitation variable, the decision tree after construction using the greedy approach having a plurality of interim leaf nodes', and,

performing a split on the solicitation variable at each of the plurality of interim leaf nodes to generate the plurality of leaf nodes, (Fig. 5, [504], shows a plurality of leaf nodes in [516, 520, 524, 528, 532]). Kohavi discloses these limitations in an analogous art for the purpose of showing how the decision tree branches off into a plurality of decision points.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to initialize the decision tree with an initial single leaf node, to

use a greedy approach, and to perform a split on the solicitation variable with the motivation of using a decision tree that will generate many decision points.

As per claim 20, Bibelnieks et al fails to disclose "wherein the split on the solicitation variable of each of the plurality of paths is a first split at the root node", but does disclose a decision-making system that optimizes total promotion revenue in [0067].

However Kohavi discloses:

wherein the split on the solicitation variable of each of the plurality of paths is a first split at the root node, (Col. 4, lines 54-67, Fig. 6, [when test result = no, the path will lead back to the beginning of the process]). Kohavi discloses this feature in an analogous art for the purpose of showing that a decision can occur at the beginning of the process.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to construct a decision tree such that the split on the solicitation variable of each of the plurality of paths is a first split with the motivation of showing that a decision with respect to solicitation can occur at the beginning of a process.

As per claim 21, Bibelnieks et al fails to disclose "initializing the decision tree with the first split at the root node on the solicitation variable, but does disclose a decision-making system that optimizes total promotion revenue in [0067].

However Kohavi discloses:

initializing the decision tree with the first split at the root node on the

solicitation variable, (Col. 4, lines 54-67, Fig. 5 [504], [first split to [508] and [512] occurs at the root nod [504]). Kohavi discloses this feature in an analogous art for the purpose of showing that a decision can occur at the beginning of the process.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to construct a decision tree such that the split on the solicitation variable of each of the plurality of paths is a first split with the motivation of showing that a decision with respect to solicitation can occur at the beginning of a process.

using a greedy approach to finish constructing the decision tree, (Fig. 5, [504], shows a plurality of leaf nodes in [516, 520, 524, 528, 532]). Kohavi discloses these limitations in an analogous art for the purpose of showing how the decision tree branches off into a plurality of decision points.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to use a greedy approach with the motivation of using a decision tree that will generate many decision points.

As per claim 22, Bibelnieks et al discloses:

Soliciting the sub-population identified, ([0062], promotion p+1 was mailed);

As per claims 23, 27, Bibelnieks et al discloses:

wherein the method is performed by execution of a computer program by a processor from a computer-readable medium, (claim 16, using a processor in a computer-readable environment).

As per claim 26, Bibelnieks et al discloses:

wherein soliciting the sub-population identified comprises one of: calling each of a plurality of members of the sub-population, mailing a solicitation to each of the plurality of members of the sub-population, and e-mailing the solicitation to each of the plurality of embers of the sub-population, ([0003], first-class mail, e-mail, telemarketing).

(10) Response to Argument

As per claims 1 and 28, appellant argues that Bibelnieks et al does not teach or suggest "setting a purchase variable to a first value for each of the plurality of members of the solicitation and the non-solicitation sub-populations that made a purchase and to a second value for each of the plurality of members of the solicitation and the non-solicitation sub-populations that did not make the purchase", since according to appellant, *Bibelnieks et al's invention only tracks purchase information for customers who were sent solicitations and is silent regarding setting a purchase variable for non-solicited members of a sub population*. However, Bibelnieks et al discloses p0 and p+1 in [0062], in which he equates to variables I and J respectively. Here, each p0 and p+1 entry of the observed cannibalization matrix (which is a predictive model) represents the purchase variables since it represents the observed maximum possible fraction of sales based upon the customers who received both promotions and purchased product. To further clarify the variables I and J that Bibelnieks introduces, this paragraph [0062] considers a promotion pair (I, J), where I is promotion p0 and J is promotion p+1, and both I and J are used to determine the maximum sales that I would have had to customers in the set S had promotion J not been mailed, thereby determining sales for I or p0 or for promotions that were not mailed, or for a non-solicited group. In addition,

multiple mail tests are implemented to measure the actual cannibalization effect of J on I by mailing a control group just I and a test group both I and J in order to facilitate a predictive modeling technique. In this case, if control group just I or p0 is mailed, which suggests setting a purchase variable for solicited members of a sub population, this also means that J or p1 is not mailed, thereby suggesting setting a purchase variable for non-solicited members of a sub population.

Claims 8-10 depend from claim 1 and are still rejected for the same reasons as discussed above with respect to claim 1.

As per claims 2-7, 11, 13-27, 29 and 30, (specifically claims 11 and 24), appellant argues Bibelnieks et al in view of Kohavi does not teach or suggest "setting the purchase variable to the first value for each of the plurality of members of the solicitation and the non-solicitation groups that made a purchase and the second value for each of the plurality of members of the solicitation and the non-solicitation groups that did not make the purchase;...applying the decision tree against the population to identify the sub-population to solicit. However, as discussed above in paragraph one of the examiners arguments, Bibelnieks et al discloses "setting the purchase variable to the first value for each of the plurality of members of the solicitation and the non-solicitation groups that made a purchase and the second value for each of the plurality of members of the solicitation and the non-solicitation groups that did not make the purchase" in [0062]. However, it is the combination of Bibelnieks et al and Kohavi that teaches the above limitation. Kohavi was cited only to cure the deficiencies of Bibelnieks et al, and to specifically show that a decision tree can be used to classify a

set of records, and at each decision-node, a test is performed based on one or more attributes (as shown in the abstract). Just as in Bibelnieks et al, customers of Kohavi are analyzed based upon historical criteria, and a decision is made whether to mail or not to mail. The purpose of incorporating Kohavi into the rejection was to show the use of decision trees in making decision-based analyses. In fact, Col. 3, lines 10-16 and Fig. 6 [616] of Kohavi shows a solicit value through representation of the make route node decision node, and the non-solicit value is represented by make route node leaf node.

Claims 2-7 and 29-30 depend from independent claim 1 and 28 respectively, and are therefore rejected for the same reasons.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Akiba Robinson

Conferees:

Vincent Millin for Vincent Millin

Igor Borissov for